The Effect of CO_2 Distribution on Thermal Buoyancy in a Greenhouse

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ABSTRAC: *An experiment was conducted to determine the extent to which the distribution of CO_2 depended on the thermal buoyancy within a greenhouse. The CO_2 levels and the change in the horizontal temperature gradient were measured throughout the greenhouse. The appropriate level of CO_2 and the concentrated mass of CO_2 were analyzed at predetermined points to verify the relation between CO_2 and temperature to establish whether a constant distribution existed throughout the facility. As a result, when using the membrane system, the CO_2 concentrations external and internal to the greenhouse were measured to be 380 ~ 440 ppm and 1020 ppm, respectively. The efficiency of the membrane system was shown to be about 268%. The highest CO_2 concentration was about 1000 ppm near the floor, where the temperature was the lowest. In contrast, at a height of 2.50 m, where the temperature was the highest, the CO_2 concentration was the lowest at about 400~500 ppm.*

Keyword: *Carbon dioxide concentration, efficiency, greenhouse, membrane system, temperature*

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